

ABSTRACT

A wafer based APC method for controlling an oxide (Cu, or TaN) polish step is described and combines a feed forward model that compensates for incoming wafer variations with a feed backward model which compensates for CMP variations. The method is geared toward minimizing Rs 3σ variations. A Rs target value is inputted with metrology data from previous processes that affects the width and thickness of the copper layer. A copper thickness target and polish time for the first wafer is determined. Post CMP measurement data of the first wafer is used to modify the polish rate with a disturbance factor and an updated polish time is computed for subsequent wafers. The CMP recipe for each wafer is adjusted with metrology data and post CMP measurements. The APC method is successful in controlling copper Rs variations for the 90 nm technology node and is independent of copper pattern density.